Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:

1. A CT detector comprising:
a scintillator array having a plurality of scintillators; and
a reflector interstitially disposed between at least two adjacent scintillators, the reflector including a light absorption element disposed between a pair of reflective elements.

[c2] 2. The CT detector of claim 1 further comprising a reflective layer coated to a face of the scintillator array.

[c3] 3. The CT detector of claim 1 wherein the light absorption element is configured to reduce optical cross-talk between the at least two adjacent scintillators.

[c4] 4. The CT detector of claim 3 wherein the light absorption element is configured to substantially eliminate optical cross-talk between the at least two adjacent scintillators.

[c5] 5. The CT detector of claim 1 wherein the light absorption element is further configured to absorb x-ray photons.

[c6] 6. The CT detector of claim 5 wherein the light absorption element is further configured to absorb approximately 50% of the x-ray photons across a gap between the at least two adjacent scintillators.

[c7] 7. The CT detector of claim 1 wherein the light absorption element is further configured to reduce x-ray punch-through.

[c8] 8. The CT detector of claim 1 wherein the light absorption element includes a high atomic number metal composite.

[c9] 9. The CT detector of claim 8 wherein the metal composite includes a cured metal powder and low viscosity polymer combination.

[c10] 10. The CT detector of claim 9 wherein the polymer includes polyurethane.

[c11] 11. The CT detector of claim 8 wherein the metal composite includes at least one of tungsten, tantalum, and a metal powder with density greater than $16g/cm^3$.

[c12] 12. The CT detector of claim 1 wherein the pair of reflective elements include TiO_2.

[c13] 13. The CT detector of claim 1 incorporated into a CT imaging system.

[c14] 14. The CT detector of claim 13 wherein the CT imaging system is configured to acquire radiographic data of a medical patient.

[c15] 15. A CT system comprising:
a rotatable gantry having a bore centrally disposed therein;
a table movable fore and aft through the bore and configured to position a subject for CT data acquisition;
a high frequency electromagnetic energy projection source positioned within the rotatable gantry and configured to project high frequency electromagnetic energy toward the subject; and
a detector array disposed within the rotatable gantry and configured to detect high frequency electromagnetic energy projected by the projection source and impinged by the subject, the detector array including:
a scintillator array configured to illuminate upon reception of radiographic energy;
a reflector assembly disposed between adjacent scintillators of the scintillator array; and
wherein each reflector assembly includes a layer sandwiched between at least a pair of reflective layers.

[c16] 16. The CT system of claim 15 wherein the composite layer includes a high-Z metal and a low-viscosity poly-

mer.

[c17] 17. The CT system of claim 16 wherein the high Z-metal includes one of tungsten and tantalum.

[c18] 18. The CT system of claim 16 wherein the low-viscosity polymer has a non-translucent color.

[c19] 19. The CT system of claim 15 wherein the at least a pair of reflective layers includes TiO_2.

[c20] 20. The CT system of claim 15 wherein each reflective layer has a lateral thickness of approximately 15-90 μm and the composite layer has a lateral thickness of approximately 50-100 μm.

[c21] 21. The CT system of claim 15 wherein the reflector assembly is cast between adjacent scintillators.

[c22] 22. A method of CT detector manufacturing comprising the steps of:
providing a scintillator array of a plurality of scintillators;
disposing a reflective layer between adjacent scintillators; and
disposing a composite layer in the reflective layer.

[c23] 23. The method of claim 22 wherein the step of providing a scintillator array includes the step of forming a substrate of scintillation material.

[c24] 24. The method of claim 23 further comprising the step of pixelating the substrate.

[c25] 25. The method of claim 24 wherein the step of pixelating includes at least one of chemically and mechanically forming gaps in the substrate to define a plurality of scintillators.

[c26] 26. The method of claim 25 wherein mechanically forming gaps includes dicing the substrate.

[c27] 27. The method of claim 25 further comprising the step of depositing reflective material into at least the gaps.

[c28] 28. The method of claim 27 wherein the step of depositing includes the step of casting.

[c29] 29. The method of claim 27 wherein the step of disposing a composite layer in the reflective layer includes the step of creating channels in the reflective material.

[c30] 30. The method of claim 29 wherein the step of creating includes at least one of laser cutting, wire cutting, and etching.

[c31] 31. The method of claim 29 further comprising the step of depositing composite material into the channels.

[c32] 32. The method of claim 31 wherein the composite ma-

terial includes a metal and a polymer.

[c33] 33. The method of claim 31 wherein the step of depositing composite material into the channels includes casting.